

BRIEF RESEARCH REPORT

**Early perception–late comprehension of grammar?  
The case of verbal -s: a response to de Villiers  
& Johnson (2007)\***

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ABSTRACT

Two recent papers (de Villiers & Johnson, 2007; Johnson, de Villiers & Seymour, 2005) have claimed that children have difficulty with verbal -s until five–six-years-old. This contrasts with perceptual studies showing evidence for sensitivity to the grammatical properties of verbal -s as young as 1;4. These apparently conflicting findings can be reconciled by differentiating between early perceptual grammatical knowledge and later semantic comprehension.

A recent paper, ‘The information in third-person /s/: acquisition across dialects of American English’, by de Villiers & Johnson (2007), argues that speakers of Mainstream American English (or Standard American English) cannot reliably use the third-person verbal agreement marker -s to determine whether the stem is a noun compound or generic verb (*the penguin dress/dresses*), or whether a stem verb is past tense or generic (*Who cut/cuts the bread?*) until they are six years old. In a clever design, children were shown pairs of pictures, for example one in which a penguin was about to put on a pair of pants, and another a dress with penguins on it. When asked to find *the penguin dress* (noun compound) or *the penguin dresses* (generic verb), their pattern of responses did not show evidence of sensitivity to the presence of the -s marker until at least five years of age. Previously, the same authors described similar findings with respect to the use of verbal -s to determine the number (plural or singular) of the preceding noun (Johnson *et al.*, 2005; I will refer to these two studies together as JV). The JV findings together suggest a very late acquisition of this verbal inflection.

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On the other hand, JV cite previous work of mine in which I employed the Headturn Preference Procedure to determine whether infants are sensitive to the verbal inflection *-s* (Soderstrom, Wexler & Jusczyk, 2002). In this work, I contrasted grammatical sentences like *A team bakes bread* with ungrammatical sentences in which the verbal *-s* has been left off, e.g. *A team bake bread*. Infants aged 1;7 showed a preference for listening to the sentences with the verbal agreement, suggesting that they are sensitive to the presence of the verbal *-s*. These infants are much younger than the children in JV, who are still showing difficulties in the receptive use of verbal *-s* at five years.

How to account for the discrepancy in ages across the studies? JV rightly point out that preference studies do not determine what underlies the infants' sensitivity. Infants in our study also showed a preference for sentences like *A team not bakes bread* over *A team not bake bread*, which is clearly not based on a mature judgment of grammaticality. JV claim that our results might therefore simply be a preference for inflected verbs over uninflected verbs. However, related work not cited by JV (Soderstrom, 2002) examined several variants of this comparison, including one, *A boy does bake/does bakes bread*, which directly addressed this possibility. Infants in this condition did not show a preference for the version with verbal inflection (*bakes*), demonstrating that infants do not simply prefer inflected verbs. These comparisons also ruled out the possibility that infants might simply prefer listening to sentences containing more *-s* inflections overall, since the *does bakes* sentences contained more *-s* inflections than the *does bake* sentences.

A more recent study of mine (Soderstrom, White, Conwell & Morgan, 2007) provides even more compelling evidence that infants' sensitivity to *-s* inflection cannot be viewed as simply a preference for the inflection itself. In this study, infants aged 1;4 heard sentences with nominal and verbal *-s* inflections on familiar and unfamiliar nouns and verbs. These inflections were either grammatically appropriate (located on a word in nominal position in a plural context and verbal position in a singular context) or inappropriate (located on a word in verbal position in a plural context and nominal position in a singular context). For example, infants heard a grammatical passage containing the sentence *Chairs are good to stand on when you sing a lot*, and an ungrammatical passage containing the sentence *Chair are good to stand on when you sings a lot*. Infants showed preferences for the sentences in which the inflection was in the grammatically appropriate place. These results cannot be explained by an appeal to simple perceptual preferences, such as a preference for inflected verbs, since the number of inflected nouns and verbs was counterbalanced across conditions. Instead, this result suggests that infants as young as 1;4 are beginning to form GRAMMATICAL representations of the functional morphemes they hear, including verbal and nominal *-s*. It is worth noting that this finding is not an

isolated one. Studies examining infants' grammatical knowledge of other functional morphemes using the Headturn Preference Procedure have similarly found evidence that infants around this age prefer the grammatical sentences (Santelmann & Jusczyk, 1998; Shady, 1996).

Do these results contradict JV? JV rightly point out that their result may be due in part to the metalinguistic nature of their task, which might require children to reflect explicitly on the role of the *-s* in the sentences presented, in order to select the correct pictorial representation. The kind of metalinguistic judgment required in this task may be beyond the skills of young children and older infants, and mask underlying grammatical knowledge about *-s* inflection that they in fact possess. There is some evidence that they are developing the ability to make explicit metalinguistic judgments about the grammaticality of sentences by six years old (Cairns, Schlisselberg, Waltzman, & McDaniel, 2006). However, the task in the JV studies was deliberately not an explicit grammaticality judgment task, but rather a semantic judgment task, in which grammatical forms were manipulated. As JV discuss, a more careful examination of how adults interpret the sentences in their studies might be useful in understanding the children's failure.

Yet there remains a discrepancy between the apparent impressive capabilities of infants and the inability to demonstrate grammatical knowledge in relatively mature young children. The discrepancy is not unique to the studies examining verbal *-s* inflection, but has been evident in other aspects of grammatical development, in particular the recent debate regarding the specificity of grammatical knowledge about verbs (see Gertner, Fisher & Eisengart, 2006; Hirsh-Pasek & Golinkoff, 1996; Tomasello, 2000). Such debates, like this one on *-s* inflection, generally center on whether attributions of linguistic knowledge to infants in perceptual studies are an overinterpretation of the data, and whether factors such as task difficulty in studies of older children mask the real capabilities of participants.

Naigles (2002) suggests that the discrepancy in the findings across age groups in these debates is due in part to methodological differences in the tasks, but more importantly to the difference in semantic content. Studies with infants are generally PERCEPTION studies, in which the stimuli and/or the task are devoid of meaning, and rather focus on the form or distributional characteristics of the stimuli. By contrast, the tasks given to young children involve analyzing the stimuli according to a particular semantic interpretation, which according to this view is particularly difficult for children. Naigles' thesis is primarily focused on explaining why infants are better able to GENERALIZE than young children. However, the argument is equally valid in explaining the current 'paradox' regarding infants' knowledge of *-s* inflection, which is not about generalization, but simply about whether children have the grammatical knowledge or not. Learning the distributional

characteristics of stimuli is relatively easy for an infant (e.g. Gomez & Gerken, 1999; Saffran, Aslin & Newport, 1996), while extracting or attaching meaning is not.

An additional complication arises when productive abilities are considered. Appropriate use of third-person singular *-s* appears relatively late in children's productions (Brown, 1973). However, most children acquire competence in its usage before the age of four years, which is still younger than JV found comprehension evidence for in their studies. It is difficult to understand how children could demonstrate the productive competence without a GRAMMATICAL understanding of the inflection. Therefore, JV's findings seem contradictory not only to infant perceptual data, but also to children's earlier productive abilities.

JV address this question by suggesting that 'in agreement in general, the features trigger agreement REFLEXIVELY in production but cannot stand alone to carry meaning in comprehension.' (Johnson *et al.*, 2005, p. 328; emphasis mine). It is not clear what is meant by *reflexively* here, but JV do seem to view the productive data as demonstrating some kind of grammatical competence. Their stance becomes clearer in the later paper, when they differentiate between productive and comprehension grammars (de Villiers & Johnson, 2007, pp. 153, 156). JV suggest that the children's failure might result from the fact that the *-s* inflection does not survive to Logical Form within a Minimalist grammatical framework (Chomsky, 1995), and therefore they cannot use the *-s* inflection in their comprehension judgments. Children (and adults) are then forced to rely on metalinguistic judgments to succeed in the comprehension tasks.

This explanation is in some ways similar to Naigles' (2002), in that it appeals to semantic considerations. The important difference lies in the explanatory force in each case. In the Minimalist explanation, the difficulty lies in how agreement is represented in the grammar (i.e. it does not appear in Logical Form). The children's difficulty is therefore specific to the agreement marker, and any other aspects of the grammar that fail to appear in Logical Form. In the Naigles explanation, children simply have difficulty with the semantic aspect of the task. Any task that involves a semantic component will be difficult. The direct appeal to semantics does not necessitate positing separate production and comprehension grammars.

The semantic explanation straightforwardly accounts for the discrepancy between JV's findings and my own infant studies. The infant studies discussed above in no way address whether infants have any understanding of the semantic consequences of verbal *-s*, or any other functional morpheme.<sup>1</sup>

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[1] However, one recent study (Kouider, Halberda, Wood & Carey, 2006) has done so for nominal *-s* in two- and three-year-olds. Productive use of nominal *-s* emerges earlier than that of third-person singular *-s* (Brown, 1973).

By contrast, while JV are attempting to access children's grammatical knowledge, explicit semantic understanding is at the heart of the design of their studies. In the case of my perceptual studies, infants are showing SENSITIVITY to the distributional properties of the language, but we are of course not claiming that the infants understand the semantic implications of verbal/nominal *-s*. It is highly likely that knowledge of the distributional properties of functional morphemes like *-s* (PERCEPTION of the grammar) greatly precedes knowledge of their interpretive implications (COMPREHENSION of the grammar). Given the growing number of studies showing infant knowledge of dependency relations between functional elements (Mintz, 2006; Santelmann & Jusczyk, 1998; Soderstrom *et al.*, 2007), which are relatively devoid of semantic content, it is unlikely that semantics is the driving force behind their acquisition. It is not necessary to posit separate grammars. We need simply suggest that children first become sensitive to these dependency relations between functional elements like the *-s* inflections, and then acquire knowledge of their implications for the meanings of sentences. Whether or not children younger than five years can be shown to comprehend the semantic implications of verbal *-s* inflection, infants' perceptual sensitivity at 1;4 suggests that the roots of this grammatical knowledge begin much earlier.

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